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Attitudinal and Normative Determinants of Task performance

Frank Fuglestad
University of Nebraska at Omaha

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Frank Fuglestad

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ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
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THESIS ACCEPTANCE

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Thesis Committee

Name	Department
Mary Ann Lawrence	Sociology
Dennis L. Dossett	Psychology
C. Raymond Williams	Psychology

Chairman

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Date

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Introduction

Theories of work motivation are numerous and varied. The search for cognitive determinants of work motivation has led to the development of expectancy theories (e.g. Vroom, 1964). The numerous expectancy theories share one assumption - people perform behavior which they expect will lead to positively valenced events. Expectancy attitude consists of beliefs concerning the probability of obtaining outcomes by performing a behavior and the value of those outcomes. A review of expectancy research reveals several inconsistencies.

Concern has been expressed about the usefulness of current theoretical frameworks and the assumptions upon which they rest (Korman, Greehaus, and Badin, 1977). The possibility that the expectancy attitude alone is inadequate in explaining work performance has led theorists to postulate boundary conditions for the theory (House, Shapiro, & Wahba, 1974) and a wide range of other variables which could influence performance. Locke (1975) suggests the assumption that people rationally consider many courses of action and consciously calculate which course will lead to pleasure or pain limits the applicability of the theory. Expectancy theory predictions would not hold for people who do not behave in such a rational manner.

The "other variable" approach is typified by the work of Kopelman (1974). Among the moderating variables suggested by Kopelman

are the organizational system's responsiveness to performance, the individual's ability, and task difficulty. Fishbein and Ajzen (1975) suggest the addition of a normative element to the expectancy framework. The moderate to high correlations obtained when the Fishbein model is used to predict intentions and behavior suggests its usefulness in predicting work performance.

This literature review will discuss several issues which have stimulated debate among expectancy theorists. The section titled "Expectancy Theories of Work Motivation" presents a brief introduction to various theoretical models which have guided expectancy research. The empirical and theoretical support for the model to be used in the proposed research will be presented. A clear specification of the criterion to be predicted is vital to any attempt to correlate the expectancy attitude with behavior. In addition, this literature review will discuss the various criteria used by expectancy researchers.

A question left largely unanswered by the current body of expectancy research is the nature of the expectancy attitude - work performance relationship. In the section titled "Cause and Effect" the evidence supporting a causal relationship will be considered.

The paper will briefly discuss the work of early attitude theorists to demonstrate the parallel evolution of expectancy and attitude theories. Among current attitude theories, Fishbein's model of behavioral intention offers the possibility of improving predictions of task

performance. This paper will review expectancy theories and research before considering the contributions Fishbein's behavioral intention model could make to predictions of work performance. The contributions of expectancy attitude and beliefs concerning the expectations of others to variance in performance levels will be examined.

Literature Review

Expectancy Theories

Cognitive theorists assume people make conscious decisions concerning the direction and intensity of behavior. Determinants of behavior are found in the beliefs, expectations, and anticipations individuals have concerning future events. The name, "expectancy theory," will be used to describe a set of theories which have been labelled cognitive, expectancy-valence, instrumentality, and valence-instrumentality-expectancy theories.

Tolman (1932) first provided an expectancy model for behavior with his suggestion that organisms are more likely to perform behavior which is expected to lead to positively valenced events. Lewin (1938) extended Tolman's work with animal behavior to humans. Both Tolman and Lewin believed an organism makes conscious decisions concerning future behavior based on cues in the present environment. Past events are important to the extent that they affect present beliefs and expectations. Motivation was viewed as a multiplicative function of expectancies and valences. Expectancies are beliefs individuals have that particular actions on their part will lead to certain outcomes. Valence is the amount of positive or negative value placed on the outcome by the individual. In equation form:

$$\text{Effort} = \text{Expectancy} \times \text{Valence}. \qquad (1)$$

Expectancy theory as described by Tolman and Lewin is essentially ahistorical. Past events are important only to the extent that they influence present beliefs and expectations. The drive theories of Hull (1943) and Thorndike (1911), on the other hand, viewed historical stimulus-response pairs as essential to present motivation.

Edwards (1954) added the additional element of subjective probability that a choice will lead to an expected outcome. Symbolically,

$$SEU = \sum_{i=1}^{n} SP_i \quad V_i \qquad (2)$$

where

SEU = expected utility associated with a given alternative;

SP_i = probability that the choice of this alternative will lead to some outcome i;

V_i = value or utility of outcome i; and

n = number of relevant outcomes.

Edwards assumed a direct link between SEU and behavior.

Peak (1955) used the same concepts to define an attitude toward an object. She stated that attitudes are related to their instrumentality for aiding or interfering with goal attainment and the satisfaction derived from reaching these goals. Instrumentality is defined as the perceived relation of an attitude object to the attainment of goals.

Rosenberg (1956) provided an early test for expectancy theory. He defined attitude as a relatively stable affective response to an

object. Attitude toward an object varies as a function of the algebraic sum of the products obtained by multiplying the rated importance of each value associated with that object by the rated potency of the object for achieving or blocking the realization of the value (Rosenberg, 1956). This is expressed in formula 3:

$$A_o = \sum_{i=1}^{n} I_i \quad V_i \qquad (3)$$

where

A_o = attitude toward an object;

I_i = the instrumentality, or probability that object o will lead to or block the attainment of goal i;

V_i = the valence of goal i; and,

n = the number of goals.

Rosenberg tested this theory by asking 120 students to indicate their opposition or approval with allowing members of the Communist Party to address the public. They were then instructed to rate belief statements according to the importance of the item as a source of satisfaction and the extent to which the belief item would tend to be achieved or blocked through the policy of allowing members of the Communist Party to address the public. The beliefs included 35 items arbitrarily chosen as representing major needs and zero to six additional items found to be salient to the particular subject. The results of the study supported the hypothesis. Rosenberg suggested two alternatives for

the establishment of attitudes. Beliefs concerning the value-attaining or value-blocking properties of an object are learned with subsequent development of affect or affect is first established through reinforcement and then beliefs are acquired in an attempt to rationalize the acquired affect. Rosenberg (1960) provided support for the latter explanation by finding attitude change after hypnotizing a person and suggesting to him that he will feel differently about the attitude object.

From the work of Rosenberg, Peak, Tolman, Lewin, and Edwards springs the numerous expectancy theories of work motivation and the attitude theories of social psychology. The common genesis of expectancy and attitude theories initiated an interrelated evolution in the attempt to explain behavior.

Expectancy Theories of Work Motivation

Georgopoulous, Mahoney, and Jones (1957) first tested an expectancy model in a work setting. They introduced a path-goal approach whereby productivity is a function of the worker's perception of the degree to which productivity is a path to the attainment of personal goals. Measures of perceived instrumentality of productivity for the attainment of 10 goals are measured. Instrumentality is the perceived relation of productivity to an outcome. Consistent with the theory, high productivity was associated with the perceived probability of attaining a goal. For workers who ranked a goal as being important to them personally, the relationship between productivity and perceived

instrumentality was stronger.

Vroom (1964) provided a more complete statement of expectancy theory in industrial psychology which has served as a basis for most subsequent work in the area. Vroom presented two models, one for the prediction of valence of outcomes and the second for the prediction of force toward behavior. An outcome is anything an individual might wish to obtain. The valence of an outcome is the strength of a person's positive or negative affective orientation toward the outcome. Valence is defined as follows:

$$V_j = \sum_{k=1}^{n} V_k \quad I_{jk} \qquad (4)$$

where

V_j = valence of outcome j;

V_k = valence of outcome k;

I_{jk} = instrumentality of outcome j for the attainment of outcome k; and,

n = number of outcomes.

This model has been applied most frequently to the prediction of job satisfaction, occupational preference, or the valence of good performance. Vroom's definition of valence as affective orientation is essentially a contemporary definition of attitude. The distinction between valence, or anticipated satisfaction, and value, or actual satisfaction resulting from the attainment of the outcome, is consistent with the

definition of attitude as a predisposition to action (Triandix, 1971).

Vroom (1964) conceptualized the force on a person to perform an act or to choose an effort level within a task as follows:

$$F_i = \sum_{j=1}^{n} E_{ij} \quad V_j \qquad (5)$$

where

F_i = the force on the individual to perform act i;

E_{ij} = the strength of the expectancy that act i will be followed by outcome j;

V_j = the valence of outcome j; and

n = the number of outcomes.

Expectancy is a person's belief concerning the probability that behavior will be followed by an outcome. Expectancy is distinguished from instrumentality in that it is an action-outcome association, while instrumentality is an outcome-outcome association. This model has been most frequently used to predict job effort. The person is predicted to choose the effort level with the greatest force.

Vroom's theory clearly stems from the work of earlier motivational theorists. Valence, as used by Vroom, is similar to Lewin's (1938) and Tolman's (1959) valence, Atkinson's incentive (1958), Peak's attitude (1955) and other theorists' expected utility (Edwards, 1954; Thrall, Coombs and Davis, 1954; Davidson, Suppes and Siegel, 1957). Vroom's definition of expectancy is similar to that of Rotter (1955),

Tolman (1959) and Atkinson (1958). Vroom's force is similar to Tolman's performance vector (1959), Atkinson's aroused motivation (1958), Luce's subjective expected utility (1962), and Rotter's behavior potential (1955).

Several modifications of the effort model have been proposed. Galbraith and Cummings (1967) included in their model a distinction between first- and second-level outcomes. The first-level outcome is the job performance resulting from effort. Second-level outcomes (e.g., pay, promotion, peer acceptance) result from performance. Generally stated,

$$W = E \left(\sum_{j=1}^{n} I_{ij} \quad V_i\right) \tag{6}$$

where

W = effort;

E = the expectancy that effort leads to performance;

I_{ij} = the instrumentality of first-level outcome i for the attainment of second-level outcome j;

V_j = the valence of second-level outcome j; and

n = number of outcomes.

This model represents a combination of Vroom's valence and force models.

Galbraith and Cumming's addition of an expectancy term has stimulated controversy. Lawler and Porter (1967) found that questionnaire respondents may not differentiate between expectancy and instrumenta-

lity. Later research (Hackman and Porter, 1968; Porter and Lawler, 1968) combined the expectancy and instrumentality elements to an effort-outcome contingency. However, Pritchard and Sanders (1973) suggested a return to the three component, valence-instrumentality-expectancy model and found the three component model correlated best with effort.

Galbraith and Cummings (1967) tested their model with workers whose performance did not depend on other workers or machinery limitations. It was assumed that expectancy would be equal to +1 in this group. The subject indicated the instrumentality of performance for each second-level outcome. Measures of performance were obtained from records of output. Stepwise multiple regression was used to test the relation of the interaction of valence and instrumentality to performance; however, the analysis did not include a test of the relation of the sum of valence multiplied by instrumentality to performance. Each second-level outcome was tested separately. Significant prediction of performance was obtained from the interaction of only one of the outcomes, supportiveness of the supervisor. The instrumentality theory, as formalized in Equation (6) did not find support in the Galbraith and Cummings study.

Campbell, Dunnette, Lawler, and Weick (1970) further elaborated the expectancy term to make a distinction between expectancy $\bar{I}$, or the perceived probability that behavior will lead to goal accomplishment,

and expectancy II, or the perceived probability that accomplishment of the task will lead to rewards. There have been no reports of improved correlations when this distinction is made.

Graen (1969) broadened expectancy theory to deal with various roles of the worker in a historical context. The attraction of a work role (e.g., effective job performer, leader, team member) is a function of the perceived attraction of various role outcomes and the perceived instrumentality of a work role for the attainment of the role outcomes. Graen points out that attraction to a role outcome differs from valence in that attraction is only the anticipated satisfaction with an outcome whereas valence refers to a positive or negative affective orientation toward the outcome. Instrumentality is defined as the degree of belief that the attainment of a particular work role will be followed by the attainment of one or more role outcomes. Symbolically,

$$A_{wr} = \sum_{i=1}^{n} O_i \quad I_i \tag{7}$$

where

A_{wr} = attraction of a work role;

O_i = attraction of role outcome i;

I_i = instrumentality of work role to the attainment of outcome i; and

n = number of role outcomes.

To provide a historical context to the model, Graen hypothesized: If a role outcome is attained following the attainment of a work role,

higher perceived instrumentality of that work role for the attainment of like role outcomes will result.

The probability of a particular work behavior is a function of the perceived expectancy that the behavior will lead to the attainment or maintenance of a work role and the attraction of that work role. Symbolically,

$$B = A_{wr} \times E \tag{8}$$

where

B = work behavior;

A_{wr} = attraction of work role; and

E = expectancy that the work behavior will lead to attainment or maintenance of the work role; or

$$B = E \left(\sum_{i=1}^{n} O_i \quad I_i\right) \tag{9}$$

with the components as previously described.

To test the theory, Graen set up three conditions: an achievement feedback condition where subjects were rewarded for effective performance; a money condition where subjects were given pay raises and told that improved performance was expected; and, a control where pay increases were noncontingent. The tasks consisted of searching a computer printout for a particular number and rounding numbers according to special rules. Subjects were told that they were being hired for part-time, temporary positions.

The results confirmed the hypothesis that the consequence of receiving an outcome following the attainment of the work role of a particular job increases the perceived instrumentality of that work role for the attainment of like outcomes. The hypothesis that job satisfaction is a function of the products of the attraction of each role outcome and the perceived instrumentality of that work role for the attainment of like role outcomes summed over all role outcomes was confirmed for only the achievement and control groups. Dividing outcomes into extrinsic and intrinsic revealed that only intrinsic outcomes were found to contribute to job satisfaction in the job incumbent role. Instrumentalities correlated more with job satisfaction than attraction of the outcomes. The hypothesis that job performance is a function of the product of the attraction of the work role of effective job performer and the perceived expectancy that increased effort will lead to effective performance found no strong support.

After considering the results of his study, Graen suggested job performance is better predicted as follows:

$$B = \left(\sum_{i=1}^{I} A_i \; I_i\right) E \; w_o + \left(\sum_{j=1}^{J} R_j \; P_j\right) w_1 + \left(\sum_{k=1}^{k} A_k \; E_k\right) w_2 \qquad (10)$$

where

B = gain in performance;

A_i = preference for outcome i;

I_i = belief that the attainment of the work role of effective performance will lead to outcome i;

E = the difference between the subjective probability that the act involving superior effort will lead to more effective performance and that for the act involving standard effort;

R_j = belief as to what person j expects him to do or not do;

P_j = perceived pressure to comply with the expectations of person j;

A_k = preference for the intrinsic consequence k of the act;

E_k = expectancy that the act will lead to consequence k; and,

w_o, w_1, w_2 = beta weights of a linear regression equation that may take any values (Graen, 1969, p. 22).

Campbell and Pritchard (1976) have presented an expectancy-instrumentality-valence theory which combines the contributions of Vroom, Graen, and Porter and Lawler (1968) to provide a comprehensive theoretical framework. The criterion variables of the model are the choice to be made among alternatives, the amount of effort which is directed toward some goal, or the change in effort or choice over time. Important characteristics of a task include content, or the kinds of behavior required to perform the task, dimensionality, level of dif-

ficulty, clarity of the task, and, locus of goal definition, or the source of specification of goal content and difficulty. These elements influence the degree of correspondence between predictions based on the model and actual effort expended or the choice among tasks. Locus of goal definition can be internal (e.g., the worker or subject) or external (e.g., the company or experimenter). Fishbein and Ajzen (1975) describe the extent to which a behavior is under volitional control as an important determinant of the ability of their model to predict behavior. Internal locus of control would suggest a high degree of volitional control over task behavior and a high correspondence between predictions derived from the worker's responses to a questionnaire and behavior.

The task characteristic, dimensionality, refers to the task content. Graen's effective performer goal could require several dimensions of task behavior and would be multidimensional. Fishbein and Ajzen (1975) made a similar distinction between single-act criteria and multi-act criteria of behavior. They described single-act criteria as requiring attitudinal specification of target, behavior, time and situation. Multiple-act criteria require specification of attitude toward target alone. Attitude-behavior correspondence is highest when "measures of attitude toward an object are related to the person's pattern of behavior rather than to any single behavior" (Fishbein and Ajzen, 1975, p. 358). Specification of behaviors engaged in during the task and the time and place of task behavior would be predicted to lead to

high correspondence to behavior on a unidimensional task. A multidimensional task would require many behaviors. Specification of valence, expectancy, and instrumentality of the task in general would be all that is necessary when a multidimensional task is used. Most field studies have been multidimensional. The rater is typically asked to consider several behaviors over a period of time.

Campbell and Pritchard define action as observable behaviors taken in pursuit of a goal and outcomes as the decision of whether the actions, or products produced by the actions, meet the criteria for goal accomplishment. Consistent with Galbraith and Cummings (1967), second-level outcomes are results of achieving or not achieving the task outcome of performance. Consistent with Graen and Porter and Lawler, a distinction is made between internal outcomes (e.g., satisfaction, pride, disgust) and external outcomes (e.g., recognition, money, promotion, harassment). Once again the issue of volitional control is raised. Although internal outcomes are originally established through external mediators, the important distinction is the degree of control the individual has over the outcomes. A higher instrumentality of job performance for internal outcomes would be expected.

A final element in the Campbell and Pritchard model is a third class of outcomes (e.g., buying a house) which are the satisfaction of basic needs and are dependent on job outcomes (e.g., salary increase). Campbell and Pritchard are reluctant to postulate the exact relationship

between these elements and exactly how they contribute to behavioral choices.

The models described are numerous and sometimes contradictory. However, they all share two or three of the same elements: valence, expectancy and instrumentality. The proposed research will use a model which combines instrumentality and expectancy into one effort-outcome expectancy. It will be shown below that separating the effort-outcome contingency into separate effort-performance and performance-outcome contingencies has not consistently resulted in improved correlations between expectancy attitude and work performance.

Instrumentality. Vroom viewed instrumentality as an outcome-outcome association. Performance is the first level outcome and is instrumental to the attainment or avoidance of second level outcomes. Vroom stated:

> It (the instrumentality of performance) can take values ranging from -1, indicating a belief that attainment of the second outcome is certain without the first outcome (performance) and impossible with it, to +1, indicating that the first outcome is believed to be a necessary and sufficient condition for the attainment of the second outcome (Vroom, 1964, p. 18).

Expectancy, on the other hand, is the subjective probability of an action-outcome association and can have values ranging from zero to one.

Vroom was ambiguous as to how instrumentality is to be operationalized. This has led to a confounding of the distinction between instrumentality and expectancy. Some researchers have combined expectancy and instrumentality in a common index (Hackman and Porter, 1968; Goodman, Rose, and Furcon, 1970; Lawler and Porter, 1967). Other researchers have viewed instrumentality as the subjective probability that performance leads to second level outcomes (Campbell, Dunnette, Lawler, and Weick, 1970; Mitchell and Albright, 1972). Some researchers allowed the range of instrumentality to vary from -1 to +1 (Galbraith and Cummings, 1967; Mitchell and Nebeker, 1973; Turney, 1974). Contrary to Vroom's original presentation is the view that instrumentality is the subjective probability of the association of first to second level outcomes with values ranging from zero to +1 (Evans, 1970; Mitchell and Albright, 1972; Graen, 1969). The use of values ranging from zero to +1 has important, theoretical and methodological implications (Wahba and House, 1974). Predictions with respect to avoidance will vary depending on whether instrumentality can take negative values.

Performance-outcome contingency is typically measured by asking subjects to rate the instrumentality of high and low performance for the attainment of outcomes. Georgopoulous, Mahoney, and Jones (1957) used this method and found that subjects who reported high instrumentality were also high producers. Other studies provide

support for a link between instrumentality and behavior. Lawler and Porter (1967) reported a correlation of r = .18 between instrumentality and performance. Gavin (1970) found a correlation of r = .27 between instrumentality and supervisor ratings of performance. Wofford (1971) reported r = .43 between instrumentality and supervisor rating of performance.

A limitation of field studies is in the nature of outcomes examined. A performance-pay instrumentality could be accompanied by a performance-peer sanction instrumentality in which case performance could be expected to increase with performance-pay instrumentality only to the extent that the performance-peer sanction instrumentality is not perceived as high.

Jorgenson, Dunnette, and Pritchard (1973) experimentally manipulated instrumentality by putting subjects in an hourly pay group or a piece rate group. Subjects in the piece rate group (high instrumentality) performed better than subjects in the hourly pay group (low instrumentality).

Arvey (1972) gave subjects a .25 or .75 probability of winning extra credit points for participation in the experiment. There was no significant performance difference between the groups despite the different performance-outcome instrumentalities.

Pritchard and Sanders (1973) found nonsignificant correlations between instrumentality and self rated effort, supervisor rated effort,

and supervisor rated performance. They reported a lowering of correlations between expectancy and effort when instrumentality was added to valence. They suggested that the error variance contributed by instrumentality may be due to the difficulty and ambiguity in estimating performance-outcome instrumentalities. Future researchers were cautioned to develop careful measures of instrumentality and draw samples from different organizations to increase true variance in instrumentality.

Expectancy. Expectancy has been measured with several different methods including a 5-point Likert scale (Dachler and Mobley, 1973; Graen, 1969) and a 7-point scale (Lawler and Suttle, 1973); Mitchel and Nebeker, 1973; Sheard, 1970). Most researchers treat expectancy as a probability with values ranging from zero to one (Arvey, 1972; Holmstrom and Beach, 1973; Mitchell and Pollard, 1973; Pritchard and Sanders, 1973; Turney, 1974).

Arvey (1972) examined the relation of perceived effort-performance contingency to performance. Subjects were told that one-fifth (low expectancy), one-half (medium expectancy) or three-quarters (high expectancy) of them would be designated "top performers." As expected, subjects in the high expectancy condition performed better than subjects in the low expectancy group. Pritchard and Sanders (1973) report contradictory results in a field study. They found expectancy correlated .14 with self-reports of effort and .02 with supervisor

ratings of effort.

Mitchell and Albright (1972) reported lowered correlations when an expectancy element was added to valance and instrumentality. Subjects were asked to indicate the amount of effort required for good performance with responses varying from "I only have to exert a slight amount of effort" to "I have to work extremely hard." Subjects were also asked, "To what extent would your performance improve if you increased your effort significantly?" with responses ranging from "would not improve" to "would improve significantly."

Lawler and Porter (1967) suggested managers were unable to distinguish between the probability that effort leads to rewards and the probability that performance leads to rewards. They reported correlations ranging from .65 to .76 ($p < .01$) between self ratings of effort and performance. They decided to use a composite index of the degree to which the attainment of rewards was tied to job effort. The only significant correlation was with self rated effort ($r = .32$, $p < .05$).

Lawler and Suttle (1973) provided an extensive examination of expectancy and instrumentality contributions to predictions of effort and performance. Table I presents correlations of effort-outcome association (E-O), effort-performance association (E-P), performance-outcome association (P-O), and $(E\text{-}P)\sum(P\text{-}O)$ with effort as rated by self, boss, and peers. Table II presents intercorrelations of the

various expectancy measures.

Insert Tables I and II about here

The evidence presented indicates that the predictive ability of an expectancy measure is not improved when expectancy and instrumentality are measured separately. Consistent with other research (Hackman and Porter, 1968; Lawler and Porter, 1967; Porter and Lawler, 1968) the proposed study will use a combined measure representing the perceived effort-outcome contingency.

Prediction of effort and performance. Most studies concerning expectancy models are correlational field studies in which existing perceptions of expectancy, instrumentality and valence are assessed via a questionnaire with the scores combined according to a particular model and correlated with another variable. The variables the models have been correlated with have included job preference (Vroom, 1966; Sheard, 1970; Wanous and Lawler, 1972; Homstrom and Beach, 1973), effort, (Hackman and Porter, 1968; Lawler and Porter, 1967; Mitchell and Albright, 1972; Mitchell and Nebeker, 1973; Pritchard and Sanders, 1973; Schuster, Clark and Rogers, 1971), and performance (Graen, 1969; Arvey, 1972; Dacher and Mobley, 1973; Jorgenson, Dunnette and Pritchard, 1973). Theoretically, the use of performance is unjustified. The expectancy models described above predict effort. Performance consists of both effort and ability (Vroom, 1974; Porter and

Table I

Correlations Between Rankings of Effort and Different Types of Expectancy Measures

Expectancy measures	Rank by self	Rank by boss	Rank by peers
E-O	31*	25*	18
$\sum$ (E-O) (V)	34*	22*	16
E-P[a]	37**	28**	5
$\sum$ (P-O)[b]	29*	19	22*
$\sum$ (P-O) (V)	31*	17	20*
(E-P) $\sum$ (P-O)	39**	29**	15
(E-P) $\sum$ (P-O) (V)	39**	28**	16

*$p < .05$.

**$p < .01$.

[a]E-P is expectancy (E).

[b]P-O is instrumentality (I).

Note. Modified from Lawler and Suttle (1973).

Table II

Intercorrelations Among Different Types of Expectancy Measures

	E-O	E-P	(P-O)
E-P	.38	—	.32
$\sum$ (P-O)	.84	.32	—
(E-P) $\sum$ (P-O)	.70	.87	.75

Note. Modified from Lawler and Suttle (1973).

Lawler, 1968). Some studies have used simple repetitious tasks with the assumption that only effort would affect performance level (Graen, 1969; Arvey, 1972; Jorgenson, et. al., 1973).

Mitchell and Albright (1972) provided correlations of expectancy attitude with effort and performance for naval officers. The expectancy model used was that described by Galbraith and Cummings (1967; see Formula 6). Commanding and executive officers rated each subject's performance and effort. Each subject also rated their own performance and effort. They reported a correlation of .50 ($p < .01$) between expectancy score and self rated effort, $r = .22$ (p = ns) for superior rated effort, $r = .36$ ($p < .01$) for self rated performance, and $r = .29$ ($p < .05$) for superior rated performance. A correlation of .30 ($p < .05$) between self and superior rated effort indicated some lack of agreement concerning perceptions of effort expended. A correlation of .83 ($p < .01$) between supervisor officers ratings of effort and performance and a correlation of .19 between subjects' rating of effort and performance suggested the superior officers were unable to discriminate between effort and performance. The authors suggested the officers were unable to closely monitor exertion and were concerned with outputs, leading to a confusion of effort and performance.

Turney (1974) reported median multiple correlations of .48 for expectancy attitude with desired effort, .31 with actual effort, and .18 with performance. Actual effort was assessed by asking professional

employees in an electronics laboratory to indicate how much time they spent at various activities. Desired effort was measured by asking respondents how much time they would like to spend doing the work activities. Performance ratings of effort correlated .59 ($p < .01$), and superior rating of job performance correlated .40 ($p < .01$) with peer rating of effort. Lawler and Porter interpreted this as evidence of convergent and discriminant validity for the peer and superior ratings. The self ratings did not meet any validity requirements.

Jorgenson, Dunnette, and Pritchard (1973) found stronger predictions of performance than effort in their experimental study with students. A multiple rank order paired comparison method was used to measure the extent to which nine job inputs, including effort, were present on the job. The perceived level of effort was estimated by the number of inputs effort was ranked over. The authors suggested the inability to predict effort from expectancy score could have been due to an inappropriate measurement of effort. They suggested that when a rank order measurement technique is used, the subject's effort level could differ at two different times on an absolute scale but still show no difference on an ipsative measure if the subject ranked effort in the same relative position.

Lawler and Suttle (1973) used three measures of effort. Effort ratings made by the subject correlated best with expectancy measures followed by boss and peer ratings of effort. The effort ratings corre-

lated better with expectancy scores than a performance rating. Effort was measured with a rank ordering of all subjects on effort put into the job. Performance of the store managers was measured with sales records.

With the exception of the Jorgenson, Dunnette, and Pritchard (1973) study, expectancy scores are better correlated with measures of effort than performance. This is consistent with the original theoretical formulations of Vroom (1964). However, the use of effort as a criterion measure presents some problems. There is no clear operational definition of effort. Researchers typically ask raters to distinguish effort from performance by considering such factors as energy, concentration, or time. Landy and Guion (1970) attempted to deal with this problem by developing behaviorally based scales of effort. The seven scales demonstrated moderate inter-rater reliability, with correlations ranging from r = .51 to .82. Williams and Seiler (1973) found that Landy and Guion's effort scales did not show discriminant validity when compared with performance measures. They found global measures of effort and measures of performance correlated .48 and .60 for self and superior ratings respectively. This is consistent with Porter and Lawler's (1968) reported r's of .47 and .59 for self and superior ratings respectively. Williams and Seiler found the correlations between global measures of effort and performance higher than correlations between global and dimensional measures of effort.

Global measures were obtained by asking the rater to judge the worker's effort on a nine point scale. Dimensional measures of effort were obtained with Landy and Guion's behaviorally anchored scales of effort. Williams and Seiler suggest the results may be due to the inclusion of result-oriented items in the effort scales.

The proposed research will use a simple repetitious task to measure performance. It is assumed that ability will make a small contribution to variance on a simple task performed by a homogenous population. The use of a performance measure avoids the problems with effort measures described above.

Cause and effect. Lawler and Suttle (1973) examined the casual nature of the relationship between expectancy attitude and motivation. They used longitudinal data and correlational analysis in a method which cannot prove causality, but which can reject the hypothesis of causality (Blalock, 1972; Pelz and Andrew, 1964; Rozelle and Campbell, 1969). The technique is described as follows: Two variables, X and Y, are each measured at two different points in time, t_1 and t_2. The six possible intercorrelations are then computed. If X causes Y, then the relationship between Xt_1 and Yt_2 (r_2) should be strong while the correlation between Yt_1 and Xt_2 (r_3) should be weak. Conversely, if Y causes X, then the relationship between Yt_1 and Xt_2 (r_3) should be stronger than the corresponding relationship between Xt_1 and Xt_2 (r_2).

Lawler and Suttle asked sixty-nine managers to fill out a questionnaire. Half filled it out again six months later and the other half repeated filling out the questionnaire a year after the original session. The expectancy model used was that described by Lawler (1971). Motivation (M) is defined as a function of the perceived likelihood that effort toward a task goal will lead to accomplishment of that goal ($E \rightarrow P$), the likelihood that the successful accomplishment of the behavior goal will result in the securing of outcomes ($P \rightarrow O$) and the valence (V) of these outcomes. The formula

$$M = (E \rightarrow P) \sum (P \rightarrow O)\ V \qquad (11)$$

was used to derive an expectancy score. Also measured were the respondent's role perceptions of their own job behavior and successful behavior on the job. Ability was measured with the Thurstone Test of Mental Alertness (Thurstone and Thurstone, 1952). Expectancy, valence, role perception, and ability were both summed and multiplied. Performance measures were collected from the subject, his boss, his peers and objective scales data. The expectancy measure $(E \rightarrow P) \sum (P \rightarrow O)\ V$ correlated .39 with self measures of performance and .28 with boss measures of performance. A multiplicative combination of the expectancy measures, role perception of successful job behavior and ability correlated .53 with the objective measure of performance. The $E \rightarrow P$ measures alone correlated just as well with performance. The data provided no support for a causal relationship. Lawler (1968)

performed a similar analysis. Lawler computed an additional correlation between changes in the expectancy measure during a year and changes in performance. A high correlation between these two changes was theorized as reducing the possibility of a third variable causing the changes in expectancy and performance. The dynamic correlation for changes in expectancy and changes in self ratings of performance was .54, clearly not ruling out a third variable.

Laboratory investigations provide better insight into the causal nature of expectancy attitude with a manipulation of expectancy and valence and observation of the consequences of the manipulations. These studies provide only modest support for causality (Arvey, 1972; Jorgenson, Dunnette, and Pritchard, 1973; Pritchard and DeLeo, 1973). Jorgenson, et. al. (1973) set up different expectancy conditions and then switched them after three days. Subjects were paid piece-rate or hourly. The perceived effort-pay probability shifted in the anticipated direction although changes in performance were less marked.

Reliability and validity of expectancy measures. Likert scales are the most popular measures of expectancy attitude. A five to eleven point scale with intuitively appealing alternatives is most often used. Korman (1971) suggests the ease of developing Likert scales and the high correlations this scale demonstrates with other attitude measures, justifies its use instead of more sophisticated measures. Hackman and Porter (1968) used Comrey's (1951) practical validity criteria as

support for the use of questionnaire scales with nonrational zeros and without equal intervals. Comrey described the importance of examining the extramathematical meaning of scales and the relation of scores to criteria of interest. Schmidt (1973) has argued that the multiplicative nature of the expectancy model requires a ratio scale.

Several researchers have reported test-retest reliabilities. Campbell (1974) measured expectancy, instrumentality, and valence at a five-day interval. He reported median correlations of .55, .77, and .84 respectively. Galbraith and Cummings (1967) administered measures of instrumentality and valence at a one-month interval. They reported a correlation of .80 for instrumentality and .50 for valence.

Dachler and Mobley (1973) looked at performance-outcome probabilities for employees working under the same supervisor. They suggested this constituted an environment where the performance-outcome contingency is the same for all employees. The average interrater reliability was .35 for Plant 1 and .20 for Plant 2. Validity was examined by asking employees to directly rate the desirability of various levels of performance and correlating this with expectancy multiplied by valence for that performance level. They reported mean correlations of .92 for Plant 1 and .68 for Plant 2. This direct measure of the desirability of various levels of performance was then correlated with the perceived chances that the performance level could be achieved. The correlations were smaller, .73 for Plant 1 and .51 for Plant 2.

The authors cited this as evidence for the construct validity of the expectancy model.

The predictive validity of expectancy measures varies with the criterion used. Self rated effort provides the best correlations with motivational measures, but use of this criterion leaves open the possibility of systematic measurement error. More accurate measures of work performance could allow direct predictions of performance without the intervening, and often unobservable, variable-effort. Behaviorally based rating scales (Smith and Kendall, 1963) offer one such possibility.

Social Norm Component

Dulany (1961) originally suggested a social norm component consisting of a behavioral hypothesis of what is expected and the motivation to comply with those expectations. Dulany successfully predicted intentions in verbal conditioning experiments using this formulation:

$$R = BI = \begin{matrix}(RHd) & (RSv) & w_1 \\ (BH) & (MC) & w_2\end{matrix} + \qquad (12)$$

where

R = reinforced response;

BI = behavioral intention to elicit that response;

RHd = hypothesis of the distribution of reinforcement;

RSv = subjective value of the reinforcer;

BH = behavioral hypothesis;

MC = motivation to comply; and

w_1 and w_2 = weights indicating the relative importance of the two components in determining behavioral intentions.

Dulany (1968) found that normative beliefs multiplied by motivation to comply had a standardized regression coefficient of .81 as opposed to .19 for the attitude term.

Fishbein (1967) expanded the applicability of the behavioral intention model to an analysis of social behavior. Fishbein's model of behavioral intention can be symbolized as follows:

$$B = BI = (A_B)w_1 + (\sum_{i=1}^{n} b_i\, m_i)w_2 \qquad (13)$$

where

B = behavior;

BI = behavioral intention;

A_B = attitude toward performing behavior B;

b_i = the person's belief that reference group or individual thinks he should or should not perform behavior B;

m_i = motivation to comply with referent i;

n = the number of referents; and,

w_1 and w_2 = empirically determined regression weights.

Fishbein does not assume a direct link between behavioral intentions and attitude toward the behavior or perceived social norms. The relative importance of these two components will vary with the behavior and the person. The regression weights w_1 and w_2 were designed to

reflect the relative importance of the two determinants.

The correspondence between behavior and intention is mediated by three factors: correspondence in level of specificity, stability of intention, and volitional control. Specificity of intentions and behavior can vary in terms of the behavior (e.g., a multi-act or single-act criterion), the target of behavior, the situation where the behavior occurs and the time of the behavior. Intentions are assumed to change over time. A lower intention-behavior relation can be expected with a longer interval between measurement of the intention and the behavior. The less volitional control demonstrated by the person, or the greater the person's dependence on others to perform the behavior, the lower the intention-behavior relation.

A distinction between external and internal sources of influence seems logical yet it could be argued that people do not separate personal and social sources. Beliefs concerning what others expect could be included in an expectancy model without a separate normative element. However, consider the normative belief, "My colleagues think I should work hard." A person could hold such a belief without necessarily believing that working hard will result in rewards from colleagues. Fishbein and Ajzen (1975) suggests different processes underlie the formation of attitude toward a behavior and normative beliefs. Fishbein reviewed studies using the model described above and reported high correlations with intention (See Table III).

Insert Table III about here

Bowman and Fishbein (1978) found the addition of the normative component increased the accuracy of predictions of voting behavior. The normative component received a significant regression weight in Davidson and Jaccard's (1975) use of Fishbein's model to predict family planning intentions.

In the area of work motivation, Georgopolous et. al. (1957) were among the first to suggest the addition of perceptions of group norms to the expectancy model. Graen (1969) also proposed a normative element. His addition of beliefs concerning what others expect and the perceived pressure to comply with the expectations of others was offered as a post hoc explanation for the lack of a strong relation between expectancy attitude and performance.

Mitchell and Nebeker (1973) used normative beliefs to predict student effort. Beliefs concerning how much time peers expected the students to study correlated .49 with self rated effort while beliefs concerning how much time faculty expected one to study correlated -.05 with self rated effort. The expectancy attitude element correlated .23 with self rated effort.

Campbell (1974) reported a median correlation of .69 between normative beliefs and motivation to comply with those beliefs. Normative beliefs multiplied by motivation to comply correlated .72 with a

Table III

Multiple Correlation Coefficients for the Prediction of Intentions to Perform Various Behaviors

Study	Intention	Multiple Correlation
Ajzen & Fishbein (1969)	Perform 8 leisure time activities.	.766*
Fishbein et. al (1970)	Send communications to coworkers.	.704
	Follow the instructions of coworkers.	.608
Ajzen & Fishbein (1970)	Choose alternative in prisoner dilemma game.	.714
Ajzen (1971)	Choose alternative in PD game.	.716*
DeVries & Ajzen (1971)	Cheat in college.	.869*
Ajzen & Fishbein (1972)	Perform 4 behaviors involving risk.	.793*
Jaccard & Davidson (1972)	Use birth control pills.	.836

*Average multiple correlation coefficients.

Note. Modified from Fishbein and Ajzen (1975).

questionnaire item asking students how hard they studied, .39 with a self-report of number of hours spent studying, and .01 with a measure of performance taken from student records. The addition of a normative element clearly provides the opportunity for improved prediction of effort, although additional research is needed.

Fishbein's Behavioral Intention Model

Most of the expectancy models of work motivation described in the literature review can be summarized as follows:

$$F = E \sum_{i=1}^{n} (I_i \ V_i) \qquad (14)$$

where

F = force to choose a particular effort level;

E = expectancy, or the perceived probability that effort will result in successful performance;

I_i = instrumentality, or the perceived probability that performance will result in outcome i;

V_i = valence or desirability of outcome i; and

n = the number of outcomes.

Fishbein's behavioral intention model can be symbolized as follows:

$$B = BI = (\sum_{i=1}^{n} b_i \ e_i)w_1 + (\sum_{i=1}^{n} SN_i \ MC_i)w_2 \qquad (15)$$

where

B = behavior;

BI = the intention to perform behavior B;

b = the belief that performing behavior B leads to outcome i;

e = the person's evaluation of outcome i;

n = the number of beliefs the person holds about performing behavior B;

SN = the person's belief that reference group or individual i thinks he should or should not perform behavior B;

MC = the motivation to comply with referent i;

n = the number of relevant referents; and

w_1 and w_2 = empirically determined regression weights.

The similarity of the first half of Fishbein's formula to the expectancy formula is evident when instrumentality is viewed as a belief and valence is seen as an evaluation of an attribute. The additional element, expectancy, can be viewed in Fishbein's terms as a belief.

Fishbein describes specificity of the behavioral intention, attitude and social norm with respect to four elements: behavior, target, situation, and time. Accurate prediction is obtained when the attitudinal and normative components of the model are measured at the same level of specificity as the behavior itself. Measures of behavior can be described in terms of single-act criteria or multiple-act criteria. Single-act criteria require a specification of behavior, target, situation and time while multiple-act criterion require a specification of target.

Significant relations between attitude toward the target and multiple-act criterion have been reported (Carr & Roberts, 1965; Bandura, Blanchard and Ritter, 1969). However, predictions of a single-act require specification of attitude toward the behavior in addition to situation and time. Studies taking this into account have reported significant findings (Tittle and Hill, 1967; Kamenetsky, Burgess and Rowan, 1956; Ajzen and Fishbein, 1970; Ajzen, 1971; Fishbein, Ajzen, Landy and Anderson, 1970). Most expectancy theory research has used a single-act criterion of behavior without making the attitudinal and normative specifications of action, target, situation and time which Fishbein described as necessary if significant relations are to be found (See Table IV).

Insert Table IV about here

An additional advantage of the Fishbein model is the addition of a normative element with its social norms and motivation to comply components. Mitchell and Nebeker (1973) added a normative element to the expectancy model and reported improved predictions of student effort. Effort was measured with a self report of time spent studying. The expectancy model correlated .23 with the effort measure. Addition of normative beliefs and the motivation to comply with those beliefs resulted in a correlation of .51 with the effort measure. Other

Table IV

Expectancy Studies Using an $E \sum IV$ Model

Investigator(s)	Overt Behavior	Relationships
Galbraith & Cummings, 1967	job performance	r=.57, .68
Graen, 1969	job performance	r=-.15 to .39
Mitchell & Albright, 1972	job performance	r=.26, .64
Pritchard & Sanders, 1973	self-rating effort	r=.47
	supervisors-rating effort	r=.16
	job performance	r=.17
Dachler & Mobley, 1973	job performance	r=.30, .12

Note. The attitude object in all the studies above was the subject's job. Modified from Mitchell (1974).

studies support the finding of improved correlations between attitude and intention or effort when a normative element is used (Mitchell and Nebeker, 1973; Campbell, 1974).

Conclusion

Heneman and Schwab (1972) pointed out three weaknesses in expectancy research: the number of independent variables studies, the measurement of these variables and the statistical analysis performed. They concluded that there is an obvious discrepancy between the theoretical and the operational definition of the relevant variables of the theory. Lawler and Suttle (1973) suggest this discrepancy is due to the complexity of the theory. Continued additions and modifications have resulted in a theory so complex that it exceeds the measures available to test it. Behling and Starke (1973) see this complexity as reason for shifting research emphasis from extension and refinement to testing of basic interactive relationships. Few researchers have used a within - subjects choice model to test the interactive relationships originally described by Vroom (1964).

Campbell (1974) questioned the basic assumptions of expectancy theory. The assumption that people will seek an effort level which maximize positively valent outcomes is not held by all. Simon (1957) suggested people seek action which will satisfy rather than engaging in behavior which will result in the maximum number of positively valent outcomes.

Several researchers have compared expectancy theory with other motivational models. Yukl, Wexley, and Seymore (1972) compared predictions of performance based on expectancy theory with

predictions based on a behaviorist approach. Expectancy theory predicts high effort when a close relation is seen between effort and outcome. A continuous reinforcement schedule should result in a higher perceived effort-outcome relation than a variable schedule of reinforcement. Skinnerian theory (Skinner, 1938) would predict the opposite. Yukl, et. al. (1972) held total pay constant for different reward schedules. Subjects performed better with a variable reinforcement schedule than a continuous schedule.

A study by Goodman, Rose, and Furcon (1970) found an expectancy model better predicted effort than three other motivational models. The motivational models (Pelz and Andrews, 1964) were: direction of motivational orientation which suggests highest effort occurs to reach the most important goal; source of motivational stimulation which predicts effort to achieve preferred sources of stimulation in work; and a model which specifies a relation between effort and job dedication and involvement. On four separate performance measures, higher correlations were obtained with expectancy scores than scores based on any of the other models.

Deci (1972) attacked a fundamental assumption of expectancy theory with his claim that making pay contingent upon performance reduces the intrinsic motivation to perform a task. Notz (1975) provided some support for Deci's contention when he found a nonadditive relation between rewards and performance in his review of motiva-

tional literature.

Others (Wahba and House, 1974; Yukl, Wexley and Seymore, 1972) have suggested a nonlinear relationship between expectancy attitude and performance.

Expectancy theory has been attacked on many fronts. The basic assumptions of the theory are questioned while current operationalization of the theoretical components is subject to contamination and deficiency. The "other variable" approach elaborates on the basic expectancy theory without addressing the particular points discussed above. Cronbach (1955) has pointed out a couple of difficulties associated with the search for moderating variables. Second or third level interactions may cloud any single moderation effect or render it inconsistent from sample to sample. Time and its consequent socialization effects may be an additional moderator that influences the magnitude and direction of other moderator effects. Cronbach points out the complexity of identifying a systematic set of moderator effects.

The consistently good predictions of intention and behavior provided by the Fishbein model recommends its use for predicting task performance. Fishbein's intention model adds to the attitudinal element of expectancy and valence a normative element. The intuitive sense of including a normative element when examining influences on behavior provides additional impetus for an experimental examination of the validity of an expanded expectancy model.

The Problem

The inconsistent findings of expectancy researchers has prompted many suggestions for improvement. The suggested improvements range from theoretical changes to better operationalization of variables. The following sections suggest some modifications of the expectancy model and stricter attention to other aspects of expectancy theory.

Expectancy Model

Expectancy models composed of valence, expectancy and instrumentality rarely produce correlations exceeding .40 with measures of effort or performance. Rearranging the original elements to produce various summative or multiplicative functions has failed to produce a clearly superior model. Fishbein's behavioral intention model adds a normative element to the attitudinal elements of expectancy theory. The reports of researchers using Fishbein's model suggest such a modification may improve predictions of behavior.

Fishbein's model makes no distinction between first and second level outcomes or expectancy and instrumentality. Using separate expectancy and instrumentality terms has not consistently resulted in improved prediction of performance. The use of a simplified model with one effort-outcome contingency is consistent with the criticism of those who argue that current expectancy models are too complex and difficult to operationalize.

Nonlinear Relationship

Previous expectancy researchers have used correlational techniques designed to describe linear relationships. Vroom (1964) suggested motivation and performance may not be linearly related. Early studies suggested that high levels of motivation may disrupt performance in chimpanzees (Birch, 1945) and humans (Patrick, 1934). McClelland (1951) provided this explanation for the nonlinear relationship between motivation and performance:

> . . . as a motive increases in intensity it first leads to an increase in the efficiency of instrumental activity and then to a decrease. Thus, it would appear that as far as adjustment is concerned there is a certain optimal level of motive intensity a level of "creative anxiety," which leads to maximum problem-solving efficiency. Too little motivation leads to sluggishness and inertia, too much to disruption and defense against anxiety. The theoretical problems unsolved are the discovery of what this area of optimum intensity is and why higher intensities lead to inefficiency (McClelland, 1951, p. 485).

Vroom suggests that high levels of motivation are associated with anxiety which impairs performance (Vroom, 1964, p. 207). The possibility of a nonlinear relationship between instrumentality and performance finds support in a study by Yukl, Wexley, and Seymore

(1972). They found that subjects who were told there was a .50 probability of being paid for a task performed better than subjects paid for every task.

Criterion Measure and Causality

The use of effort as a criterion measure has presented considerable problems to expectancy researchers. The use of simple repetitious tasks to measure performance offers the possibility of minimizing the influence of factors other than effort (Graen, 1969; Arvey, 1972; Jorgenson, Dunnette and Pritchard, 1973).

The correlational studies described in the literature review offer no evidence concerning the causal nature of expectancy attitude. The crosslagged and dynamic correlation techniques used by Lawler and Suttle (1973) and Lawler (1968) cannot prove causality but can only reject the hypothesis of causality (Blalock, 1972; Pelz and Andrews, 1964; Rozelle and Campbell, 1969). The experimental techniques of other researchers (Arvey, 1972; Atkinson and Reitman, 1956; Graen, 1969; Jorgenson, Dunnette and Pritchard, 1973; Pritchard and DeLeo, 1973; Yukl, Wexley and Seymore, 1972) provide better evidence for a causal relation between expectancy attitude and performance.

Hypotheses

The study used a modification of Fishbein's model of behavioral intention. Symbolically,

$$P = W_1 \sum E \cdot V + W_2 \sum SN \cdot MC \qquad (16)$$

where

P = performance on a simple repetitious task;

E = the expectancy that effort will lead to outcome;

V = the valence of the outcome;

SN = belief concerning the expectation of a referent other;

MC = the motivation to comply with the referent other; and

W_1 and W_2 = empirically determined regression weights.

This model was compared with a model using unit weights.

The model described above also was compared with an additive model,

$$P = E + V + SN + MC \qquad (17)$$

and traditional expectancy models. It is hypothesized that Equation 16 will have a higher correlation with performance than any other combination of the model elements.

Fishbein's model was compared with models which specify two contingency elements, expectancy and instrumentality. Specifically, Equation 16 was compared with Lawler's (1971) work motivation model,

$$M = (E \rightarrow P) \sum (P \rightarrow O) V \qquad (18)$$

where

M = motivation,

$E \rightarrow P$ = perceived effort-performance contingency,

$P \rightarrow O$ perceived performance-outcome contingency, and

V = valence of outcome.

Motivation and valence were operationalized in the same manner as performance and valence in Equation 16. The three contingency measures were the effort to outcome contingency in Equation 16, the effort to performance contingency in Equation 18, and the performance to outcome contingency in Equation 18.

All the model elements were manipulated to produce three levels of effort-outcome expectancy, two levels of valence, three levels of perceived social norm and two levels of motivation to comply. Manipulation of motivation to comply was attempted by varying the attractiveness of the referent other. A collary hypothesis states: Attractiveness of the referent other is associated with motivation to comply with the referent other.

Implicit in Equation 16 is the hypothesis: Normative influence on performance is independent of attitudinal influence. Normative influence is the combined effect of beliefs concerning the expectation of a referent other and the motivation to comply with the referent other. Attitudinal influence is the combined effect of beliefs concerning the expectation that effort will lead to outcome and beliefs concerning the

valence of the outcome. This hypothesis predicts no interaction between any of the normative and attitudinal elements.

Method

Subjects

One hundred and eight volunteer undergraduate students enrolled in summer session psychology and sociology courses at the University of Nebraska at Omaha participated in the study. Thirty-five males and seventy-three females were given extra credit in their courses for participating in the study.

Design

Manipulated variables were valence of payment received, the effort-outcome contingency, experimenter expectation, and motivation to comply with the experimenter. There were two levels of valence and motivation to comply and three levels of contingency and experimenter expectation. Dependent variables were perceptions of the above elements, liking for the experimenter, and performance on a simple, repetitious task.

Procedure

The subjects were escorted to a small private room where they were asked to complete an informed consent form and Byrne's Attitude Scale (1971). The experimenter collected the completed Attitude Scale and asked the subjects to read instructions concerning the contingency and valence of the product pricing task. Meanwhile, the experimenter completed a survey reflecting agreement or disagreement with the subject's questionnaire. The experimenter then verbally repeated the

valence and contingency instructions, stated how much he expected the subject to do, and asked the subject to examine the constructed attitude scale and fill out the Interpersonal Judgement Scale and student questionnaire. The subjects were then asked to perform the product pricing task.

Independent and Dependent Variables

Contingency manipulation. Three groups of subjects received different instructions concerning the likelihood that a high rate of effort will lead to payment. Subjects were told that ten, fifty, or ninety percent of the hardest workers would receive payment in addition to the two extra credit points given to everyone who participated. Subjects were given written instructions concerning contingency (See Appendix A). These instructions were repeated verbally by the experimenter (See Appendix B).

A questionnaire was administered before subjects began the task to see if the manipulations had their desired effect. Questions one and eight of the Student Questionnaire (See Appendix C) were used to elicit perceptions of the likelihood that effort would lead to payment. Question one had seven response alternatives ranging from extremely unlikely to extremely likely. Question eight asked subjects to indicate the probability that payment would be received for hard work. Additional questions were asked regarding the effort to performance contingency (See Question 3 in Appendix C) and the performance to outcome

contingency (See Question 5 in Appendix C).

Valence manipulation. Subjects were told that they could receive payment in addition to the two extra credit points given to all subjects. Twenty-five cents or three dollars were given to the best performers. Questions two and nine of the Student Questionnaire were designed to measure valence of payment on a seven point scale with responses ranging from extremely good to extremely bad.

Social norm manipulation. Subjects were told the mean performance of subjects in the pilot study. The experimenter stated that he expected the subject to finish a certain number of tasks within thirty minutes. The various expected performance levels were determined by the number of tasks completed by 90, 50, or 10 percent of subjects in the pilot study. The subjects were asked to indicate on a seven point scale the likelihood that the experimenter thought they should work hard. Response options ranged from likely to unlikely (See Questions 4 and 10 in Appendix C).

Motivation to comply manipulation. Fishbein and Ajzen (1975) suggested that a person's motivation to comply increases with the referent's power over the person. French and Raven (1959) provided several bases of social power including reward power, coercive power, legitimate power, referent power and expert power. Referent power increases with the attraction of the person to the referent. The extensive work of Byrne (1971) concerning attraction provides some

suggestions for experimental manipulation of attraction.

The experimental situation permitted the exertion of three or four of the five types of power described by French and Raven (1959). The experimenter has reward power, legitimate power, and possibly, coercive power. These bases of power were not manipulated, although individual differences in perceived influence of these bases of power probably exist. It was assumed that the referrent attraction manipulation would influence performance more than individual differences in perception of the other bases of power.

The extent to which task performance is observable could affect the relative contributions of attitudinal and normative elements. French and Raven (1959) suggest that internalization (i. e., attitude change) is less influenced by observability than normative influences. Observability was held constant at a high level. Although the subjects were not observed while performing, they reported their performance to the experimenter.

The attraction research of Byrne (1971) has repeatedly pointed to the importance of perceived similarity on attraction. The perceived similarity of the subject to the experimenter was manipulated. Subjects were asked to fill out Byrne's Attitudinal Scale (1971; See Appendix D). A survey reflecting agreement or disagreement with the subject's responses was completed. The experimenter stated that he completed the constructed survey and the subject was asked

to examine it. The disagreement survey had responses opposite to the subject's on all of the important items while the agreement survey had the same responses on all the important items. Byrne (1971) described items concerning beliefs about such things as God and integration as important. A pilot study was conducted to determine which items are viewed as important to the subject population.

A modified version of the Interpersonal Judgement Scale (Byrne, 1971; See Appendix E) was completed by the subject to see if the similarity manipulation had the desired effect on attraction. To assess the effect on motivation to comply, the questionnaire asked the subject to indicate agreement or disagreement with the statement, "In general, I want to do what the experimenter wants me to do." Seven response alternatives ranged from strongly agree to strongly disagree. Subjects were also asked to respond to the question, "How important is it that you do what the experimenter wants you to do?" Seven response options ranged from extremely important to extremely unimportant. (See Questions 6 and 7 in Appendix C).

Performance measure. Subjects were given a list of products from a department store catalog (See Appendix F). The task consisted of looking up the product name in an index, finding the catalog page number where the item could be found, looking up the product in the catalog and writing down the price. The number of items found after thirty minutes constituted the performance measure. It was assumed

that ability did not play a significant role in performance for this simple, repetitious task. The task is similar to that described by Jorgensen, et. al., (1973) in their experimental investigation of expectancy attitude in a simulated work setting.

Results

Reliability

Each component of the Fishbein motivation model was measured with two questionnaire items (See Appendix C for questionnaire items). For example, effort-outcome contingency was measured by asking subjects to respond to the statement, "Working hard at the product pricing task will result in earning three dollars" with response alternatives ranging from extremely likely to extremely unlikely. The second measure of effort-outcome contingency asked subjects to complete the statement, "The chances are ____ in 100 that I will get three dollars if I work hard." The correlation between these two contingency measures was .30. This low correlation may have been due to the different formats of the two items. The correlation between the two questionnaire items designed to measure valence was .64, the correlation between the experimenter expectation measures was .65 and the correlation between the motivation to comply measures was .47 (See Table V).

Insert Table V about here

The two items in the Interpersonal Judgement Scale were correlated to provide an estimate of reliability. The correlation of .55 suggested this measure of attraction had only moderate reliability.

Table V

Reliabilities of Motivational Elements

Construct	Questionnaire items measuring construct[a]	Number of cases	Pearson correlation coefficient[b]
Valence	2, 9	107	.64
Effort-Outcome Contingency	1, 8	104	.30
Experimenter Expectation	4, 10	108	.65
Motivation to Comply	6, 7	107	.47

[a]Appendix A contains the student questionnaire.
[b]All correlation coefficients are significant at $p < .01$.

Manipulation Checks

Table VI presents the means and standard deviations of questionnaire responses under all treatment conditions, t values are also provided to compare the means. Questionnaire items measuring perceptions of valence and experimenter expectation were the only items which significantly reflected experimental manipulations. Subjects in the high-valence condition ($3.00) evaluated the payment more favorably than subjects in the low-valence condition (25¢). This was reflected in both questionnaire items measuring valence. Subjects in the high and medium experimenter-expectation conditions perceived the experimenter as expecting greater effort than subjects in the low experimenter expectation condition.

Insert Table VI about here

The motivation of the subjects to comply with the expectations of the experimenter was manipulated by varying the perceived similarity of the experimenter's beliefs to those of the subject. The variation in attitude similarity was hypothesized to lead to differences in attraction and then to differences in motivation to comply. Attraction was measured with two items from Byrne's Interpersonal Judgement Scale. These items showed little correlation with the motivation to comply manipulation ($r = .10$ and $.09$). Student's t-tests were used to compare questionnaire responses on the Interpersonal Judgement Scale

Table VI

Comparison of Means and Standard Deviations of Questionnaire Items

Experimental Condition		Questionnaire Item	Mean	Standard Deviation	T-Test I-Ratio	T-Test Degrees of Freedom	One Way Analysis of Variance F-Ratio	One Way Analysis of Variance Degrees of Freedom	Significant ($p < .05$) Group Comparisons Using Scheffe Procedure
Valence	High	Valence 1	4.56	.82	2.15*	105			
	Low		4.11	1.27					
	High	Valence 2	4.76	1.15	2.23*	106			
	Low		4.15	1.65					
Motivation to Comply	High	Motivation to Comply 1	4.59	1.32	-.65	106			
	Low		4.76	1.34					
	High	Motivation to Comply 2	4.81	1.30	.33	105			
	Low		4.74	1.13					
Effort-Outcome Contingency	High	Contingency 1	5.14	1.33			1.0	2/106	
	Medium		5.20	1.18					
	Low		5.47	.91					
	High	Contingency 2	66.69	34.28			1.72	2/104	
	Medium		52.34	28.64					
	Low		56.89	35.81					
Experimenter Expectation	High	Experimenter Expectation 1	5.67	1.12			7.79**	2/107	High-Low
	Medium		5.69	1.91					
	Low		4.69	1.35					
	High	Experimenter Expectation 2	5.42	1.05			3.72*	2/107	High-Low
	Medium		5.28	1.14					
	Low		4.72	1.23					

*$p < .05$ **$p < .01$

for the two experimental conditions of motivation to comply. No significant differences between mean responses were found.

The Student Questionnaire contained two questions concerning motivation to comply with the experimenter. These items correlated little with the measures of attraction (r ranged from .02 to .18). The motivation to comply manipulation did not significantly influence responses concerning attraction or perceived motivation to comply.

Experimental Manipulations and Performance

An analysis of the effect of experimental manipulations of the motivational elements on performance supplemented the analysis of perceptions of motivational elements. Four constructs were manipulated: valence, effort to outcome contingency, experimenter expectations and motivation to comply. An examination of Table VII reveals one significant main effect—experimenter expectation. There were no significant interactions. All main effects and interactions accounted for 37% of the variance in performance. The estimated squared multiple correlation for the population is .27.

Insert Table VII about here

The mean performance levels for the three groups receiving different instructions concerning experimenter expectation were compared. Group One was told that the experimenter expected them to complete 33 items of the product pricing task in thirty minutes. Sub-

Table VII

Contributions of Experimental Manipulations to Variance in Performance

Source	Sum of Squares	Degrees of Freedom	F	Proportion of Variance
Valence	194.68	1	2.97	.0261
Contingency	50.80	2	.39	.0068
Experimenter Expectation	518.13	2	3.95*	.0694
Motivation to Comply	94.45	1	1.44	.0126
Main Effects	858.05	6	2.18	.1149
Valence X Contingency	134.13	2	1.02	.0179
Valence X Experimenter Expectation	40.57	2	1.0	.0054
Valence X Motivation to Comply	94.45	1	1.44	.0126
Contingency X Experimenter Expectation	498.148	4	1.90	.0667
Contingency X Motivation to Comply	152.80	2	1.16	.0222
Experimenter Expectation X Motivation to Comply	1.80	2	1.0	.0002
Two Way Interactions	921.90	13	1.08	.1250
Valence X Contingency X Experimenter Expectation	470.37	4	1.79	.0630
Motivation to Comply X Contingency X Experimenter Expectation	304.04	4	1.16	.0407
Valence X Contingency X Motivation to Comply	5.68	2	1.0	.0008
Valence X Experimenter Expectation X Motivation to Comply	18.02	2	1.0	.0024
Three Way Interactions	798.11	12	1.01	.1068
Valence X Experimenter Expectation X Motivation to Comply X Contingency	166.26	4	1.0	.0223
Regression	2744.33	35	1.19	.3690
Residual	4725.90	72		
Total	7470.23	107		

*$p < .05$.

jects in Group One finished an average of 27 items in the thirty minutes. Subjects in Group Two were told that they were expected to complete 23 items in thirty minutes. Subjects in this group looked 31 items on the average. Subjects in Group Three were told that the experimenter expected them to look up 15 items. The average performance for Group Three was 32 items. Using the conservative Scheffe procedure for comparing means reveals one significant difference ($p < .05$)--between Groups One and Three. Subjects who were told that the experimenter expected them to perform at a high level looked up the fewest items whereas subjects in the low expectation group performed at the highest level. These results clearly contradict the original hypothesis.

Motivational Models and Performance

One hypothesis of the study stated that Fishbein's model would provide the best prediction of performance. The Student Questionnaire was designed to measure perceptions of the Fishbein model elements. Valence, experimenter expectation, motivation to comply, and three kinds of contingency were examined. Perceptions of effort-outcome contingency were measured along with performance-outcome and effort-performance contingencies. Table VIII presents regression equations with various combinations of these subjective motivational elements. Regression Equation 1 represents Fishbein's model. The multiple correlation between the motivational elements of this model and

performance was .22. In the equation reflecting the Fishbein model, effort-outcome contingency multiplied by valence contributed little to the equation's ability to predict performance.

Insert Table VIII about here

In Regression Equation 2 each motivational element was entered separately instead of multiplied as in Regression Equation 1. This resulted in a low, nonsignificant multiple R which was not significantly different from the multiple R obtained with Equation 1.

Regression Equation 4 represents Lawler's work motivation model. The product of the effort-performance contingency multiplied by the performance-outcome contingency and valence was correlated performance. The result was a small but significant correlation.

Regression Equation 5 represents a model with unit weighting. In this equation effort-outcome contingency was multiplied by valence and added to experimenter expectation multiplied by motivation to comply. The products were standardized to produce z scores. The sum of the two products was correlated with performance. The resulting simple correlation was slightly smaller than the multiple correlation obtained without unit weighting.

Equation 3 adds the normative component from Fishbein's model to Lawler's motivation model. Fishbein's model uses a single effort to outcome contingency while Lawler's model uses two contingencies—

Table VIII

Regression Equations for Various Motivation Models

Predicting Performance

	Model[a]	Regression equation[b]	R	R^2
1.	$P = E \rightarrow O \cdot V + EE \cdot MC$	$P = .03(E \rightarrow O \cdot V) + .21(EE \cdot MC)$	.22	.05
2.	$P = E \rightarrow O + V + EE + MC$	$P = .07\ V - .02\ E \rightarrow O + .07\ EE + .16\ MC$	.21	.05
3.	$P = E \rightarrow P \cdot P \rightarrow O \cdot V + EE \cdot MC$	$P = .21(E \rightarrow P \cdot P \rightarrow O \cdot V) + .16(EE \cdot MC)$	.30**	.09
		r	r^2	
4.	$P = E \rightarrow P \cdot P \rightarrow O \cdot V$	.26**	.07	
5.	$P = E \rightarrow O \cdot V + EE \cdot MC$[c]	.19*	.04	

[a] V - valence, EE - experimenter expectation, MC - motivation to comply, $E \rightarrow P$ - effort to performance contingency, $P \rightarrow O$ - performance to outcome contingency, $E \rightarrow O$ - effort to outcome contingency, P - performance.

[b] Stepwise regression with standardized weights.

[c] Using unit weighting.

*$p < .05$.
**$p < .01$.

effort-performance and performance-outcome. The combined model (Equation 3) had a significantly higher correlation with performance than the additive model (Equation 2; $F(1, 105) = 5.30$, $p < .01$) or the unit weighting model (Equation 5; $F(1, 105) = 6.22$, $p < .01$). None of the other differences between multiple correlations were significant.

Implicit in Fishbein's model is the hypothesis that attitudinal and normative influences are independent of each other. Normative influence is the combined effect of beliefs concerning experimenter expectation and motivation to comply with the experimenter. Attitudinal influence is the combined effect of beliefs concerning outcome contingencies and the valence of the outcome. The correlations between attitudinal and normative components were .22 ($p < .05$) and .30 ($p < .01$) suggesting these components are not entirely independent.

Discussion

The lack of a strong correlation between the perceptions of the motivational elements and performance could have been due to the unreliability and low validity of the questionnaire measures of the motivational elements. Other researchers have reported test-retest reliability coefficients ranging from .50 to .84 (Galbraith and Cummings, 1967; Campbell, 1974). Dachler and Mobley (1973) reported interrater reliability coefficients of .35 and .20. The present study was unique in its use of the correlation between different items designed to measure the same construct to provide an estimate of reliability.

Low validity was indicated by the lack of correspondence between manipulations of the motivational elements and perceptions of the same elements. Correlations between experimental condition and perceptions of the motivational elements ranged from .00 to .31. The low correlation of questionnaire responses with performance suggests the questionnaire had poor predictive validity. This could have been due to the failure to consider outcomes other than money. Measuring the valence and contingency of additional outcomes (e.g. self-satisfaction) could improve the model's ability to predict performance.

The hypotheses of the study concerned both perceptions of motivational elements and manipulation of those elements. The first

hypothesis suggested that performance could be best predicted with subject perceptions of motivational elements combined according to Fishbein's attitude model. This hypothesis was unsupported. The Fishbein model had a multiple correlation coefficient of .22 with performance. Combining the Fishbein model and Lawler's expectancy model of work motivation produced a correlation of .30, a nonsignificantly larger correlation.

The second hypothesis predicted that manipulation of the motivational elements comprising the Fishbein model would result in variation in performance. The only successful manipulation was experimenter expectation. Experimenter expectation accounted for 7% of the variance in performance. All main effects and interactions together accounted for 37% of the variance in performance.

There were two collary hypotheses. The first stated that attractiveness to the referent other is associated with motivation to comply with the referent other. This hypothesis was not supported. The second collary hypothesis stated that normative influence on performance is independent of attitudinal influence. Correlations between normative and attitudinal elements were low to moderate suggesting perceptions of these elements are not entirely independent.

The only manipulation which significantly affected performance was experimenter expectation. The effect of the experimenter expectation manipulation on performance was opposite to what was predicted.

The group expected to do the most looked up the fewest items while the low expectation group had the best performance. High experimenter expectation may have raised motivation above the optimal level described by McClelland (1951) and Vroom (1964). High anxiety may have interferred with performance by subjects inexperienced with the task. Reactance theory could also account for these findings. Brehm (1976) suggested that threats to freedom arouse reactance with consequent attempts to re-establish threatened freedom. Expectations of performance may have threatened the subject's freedom to perform as desired. This freedom could be re-established by performing at a level other than that expected.

The manipulations of valence, contingency, and motivation to comply had no effect on perceptions of these elements or performance. If reactance was aroused, it may have overshadowed the effects of the valence and contingency manipulations. The attempt to vary the attractiveness and referent power of the experimenter had no effect on motivation to comply with the experimenter. Manipulation of other sources of power may be more effective. For example, legitimate power could be varied by having a student peer or the experimenter express the expected performance level.

Several artifacts may have been operating in this experimental situation. The subjects were aware of the purpose of the study and may have realized that the experimenter was attempting to manipulate

their motivation. Suspicion of the experimenter's intent may have lead to the formation of reactance or negativism in the subjects. Some subjects participating during the latter part of the study may have been aware of the experimental procedure through conversation with other subjects. One subject complained of not being paid as much as a friend who had participated earlier. No provision was made for comparisons of this type or prior knowledge of the experimental procedure.

The experiment probably had little meaning to the subjects except as a vehicle to earn extra credit. The experimental manipulations may have been passively endured rather than considered. During the product pricing task, some subjects may have exerted the minimal effort needed to appear to be participating and earn the extra credit. The Fishbein model is typically applied to predicting behavior more central to the subject's life, such as voting (Bowman and Fishbein, 1978) or family planning intentions (Davidson and Jaccard, 1975). The predictive ability of the model may have suffered in the present laboratory situation.

An additional artifact may have been anxiety associated with perceived evaluation occurring during the experiment. The subjects were asked to fill out three questionnaires and perform a task. This may have been perceived as an evaluation process which could induce anxiety and affect performance (Rosenberg, 1969).

The low validity and unreliable questionnaire measures of this study suggest that the failure to support Fishbein's model may have been due to inadequate measures and manipulations rather than weaknesses inherent in the theory. Additional research could focus on alternative methods of manipulating the motivational elements. The parameters of the theory need additional specification. For example, the situational features leading to the arousal of reactance need to be specified. When reactance is aroused, the model will need to be modified. Fishbein's model can continue to provide a framework for additional work motivation research with its focus on both attitudinal and normative influences. However, the model only begins to describe the numerous variables and interactions controlling performance.

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Appendix A

Written Instructions Concerning Valence and Contingency

Student Instructions

As part of today's experiment you will be asked to do a product pricing task. Students with ability similar to yours did this product pricing task last week. On the average, they were able to price 23 products in thirty minutes. Of all the people doing the pricing task, the top ten percent will receive 25¢. This is in addition to the extra credit points given to everyone who participates. All students doing the pricing task are of about equal ability.

The instructions above were given to subjects in the low valence, low contingency group. For subjects in the high valence condition "25¢" was replaced with "$3.00." For subjects in the medium and high valence conditions, "top ten percent" was replaced with "top fifty percent" and "top ninety percent," respectively.

Appendix B

Verbal Instructions Given by Experimenter

Verbal Instructions

The top ten percent of the hardest workers will receive twenty-five cents. On the average, other students were able to price 23 products in thirty minutes. I expect you to price 15 items in thirty minutes.

The instructions above were given to subjects in the low valence, low contingency, low experimenter expectation group. Subjects in the high valence condition were read "three dollars" instead of "twentyfive cents." Subjects in the medium and high contingency conditions were read "top fifty percent" and "top ninety percent," respectively, instead of "top ten percent." "I expect you to price 15 items" was modified to "23 items" and "33 items" in the medium and high experimenter expectation groups.

Appendix C

Student Questionnaire

Please circle the response corresponding to your best answer for each item. Circle only one response for each item. Circle your sex: Male Female

1. Working hard at the product pricing task will result in earning three dollars.

extremely unlikely | very unlikely | unlikely | borderline | likely | very likely | extremely likely

2. Earning three dollars for doing the product pricing task is:

extremely good | very good | good | neutral | bad | very bad | extremely bad

3. Working hard at the product pricing task will result in getting a lot accomplished.

extremely likely | very likely | likely | borderline | unlikely | very unlikely | extremely unlikely

4. The experimenter expects me to work hard at the product pricing task.

extremely unlikely | very unlikely | unlikely | borderline | likely | very likely | extremely likely

5. Getting a lot accomplished at the product pricing task will result in earning three dollars.

extremely likely | very likely | likely | borderline | unlikely | very unlikely | extremely unlikely

6. In general, I want to do what the experimenter thinks I should do.

strongly agree | slightly agree | agree | neither agree nor disagree | disagree | slightly disagree | strongly disagree

7. How important is it that you do what the experimenter wants you to do?

extremely important | very important | important | neutral | unimportant | very unimportant | extremely unimportant

8. The chances are _____ in 100 that I will get three dollars if I work hard.

Put an X on the blank which represents your evaluation of the item.

9. Three dollars is:

good _____ _____ _____ _____ _____ _____ _____ bad

10. The experimenter wants me to put a lot of effort into the product pricing task.

extremely unlikely | very unlikely | unlikely | borderline | likely | very likely | extremely likely

Please circle the response corresponding to your best answer for each item. Circle only one response for each item. Circle your sex: Male Female

1. Working hard at the product pricing task will result in earning twenty-five cents.

extremely unlikely	very unlikely	unlikely	borderline	likely	very likely	extremely likely

2. Earning twenty-five cents for doing the product pricing task is:

extremely good	very good	good	neutral	bad	very bad	extremely bad

3. Working hard at the product pricing task will result in getting a lot accomplished.

extremely likely	very likely	likely	borderline	unlikely	very unlikely	extremely unlikely

4. The experimenter expects me to work hard at the product pricing task.

extremely unlikely	very unlikely	unlikely	borderline	likely	very likely	extremely likely

5. Getting a lot accomplished at the product pricing task will result in earning twenty-five cents.

extremely likely	very likely	likely	borderline	unlikely	very unlikely	extremely unlikely

6. In general, I want to do what the experimenter thinks I should do.

strongly agree	slightly agree	agree	neither agree nor disagree	disagree	slightly disagree	strongly disagree

7. How important is it that you do what the experimenter wants you to do?

extremely important	very important	important	neutral	unimportant	very unimportant	extremely unimportant

8. The chances are _____ in 100 that I will get twenty-five cents if I work hard.

Put an X on the blank which represents your evaluation of the item.

9. Twenty-five cents is:

good _____ _____ _____ _____ _____ _____ _____ bad

10. The experimenter wants me to put a lot effort into the product pricing task.

extremely unlikely	very unlikely	unlikely	borderline	likely	very likely	extremely likely

Appendix D

Survey of Attitudes

Please circle the response which describes your attitude for each item. Check only one response for each item.

1. Money is one of the most important goals in life.

strongly agree	slightly agree	agree	neither agree nor disagree	disagree	slightly disagree	strongly disagree

2. Sororities as they usually function are good.

strongly disagree	slightly disagree	disagree	neither agree nor disagree	agree	slightly agree	strongly agree

3. There is a God.

strongly agree	slightly agree	agree	neither agree nor disagree	disagree	slightly disagree	strongly disagree

4. Grades reflect a person's ability and knowledge.

strongly agree	slightly agree	agree	neither agree nor disagree	disagree	slightly disagree	strongly disagree

5. I am in favor of smoking tobacco.

strongly agree	slightly agree	agree	neither agree nor disagree	disagree	slightly disagree	strongly disagree

6. War is sometimes necessary to solve world problems.

strongly disagree	slightly disagree	disagree	neither agree nor disagree	agree	slightly agree	strongly agree

7. I enjoy gardening.

strongly agree	slightly agree	agree	neither agree nor disagree	disagree	slightly disagree	strongly disagree

8. It is important for a person to have a college education to be successful.

strongly agree	slightly agree	agree	neither agree nor disagree	disagree	slightly disagree	strongly disagree

9. The federal government should increase our reserve of nuclear arms.

strongly disagree	slightly disagree	disagree	neither agree nor disagree	agree	slightly agree	strongly agree

10. I like classical music.

strongly agree	slightly agree	agree	neither agree nor disagree	disagree	slightly disagree	strongly disagree

11. I am in favor of a military draft for men.

strongly agree	slightly agree	agree	neither agree nor disagree	disagree	slightly disagree	strongly disagree

Appendix E

Interpersonal Judgement Scale

Judgement Scale

Check the one response for each item which reflects your feelings about the experimenter.

1. _____ I feel that I would probably like this person very much.
_____ I feel that I would probably like this person.
_____ I feel that I would probably like this person to a slight degree.
_____ I feel that I would probably neither particularly like nor particularly dislike this person.
_____ I feel that I would probably dislike this person to a slight degree.
_____ I feel that I would probably dislike this person.
_____ I feel that I would probably dislike this person very much.

2. _____ I believe that I would very much dislike working with this person in an experiment.
_____ I believe that I would dislike working with this person in an experiment.
_____ I believe that I would dislike working with this person in an experiment to a slight degree.
_____ I believe that I would neither particularly dislike nor particularly enjoy working with this person in an experiment.
_____ I believe that I would enjoy working with this person in an experiment to a slight degree.
_____ I believe that I would enjoy working with this person in an experiment.
_____ I believe that I would very much enjoy working with this person in an experiment.

Appendix F

Product Pricing Form

PRODUCT PRICING FORM

Look up the product name in the catalogue index. The index begins on page 570. Turn to the page where the product is described. Find the product with the correct catalogue number. The catalogue number is located at the end of the product description. Copy the price in the "Price" column. Copy the product's shipping weight in the "Shipping Weight" column.

For example:

PRODUCT	CATALOGUE NUMBER	PRICE	SHIPPING WEIGHT
Mirrors, Door	21K6070L		

To find "Mirrors, Door" lock in the index under the boldface heading "Mirrors." Under "Mirrors" find the entry "Door." To the right of "Door" is the page number 1251. Turn to page 1251 and find catalogue number 21K6070L. To the right of the catalogue number are the shipping weight and price. Enter each in the appropriate column as follows:

PRODUCT	CATALOGUE NUMBER	PRICE	SHIPPING WEIGHT
Mirrors, Door	21K6070L	9.49	7 lbs.

Be sure to include lbs. or oz. after the product weight.

Begin when instructed to.

PRODUCT	CATALOGUE NUMBER	PRICE	SHIPPING WEIGHT
1. Chairs, Bean Bag	1K20244NH		
2. Oil, Engine	28K70388L		
3. Batteries, Boat	28K9650N		
4. Coats, Girls'	N77K2736F		
5. Books, Banjo Instruction	58K86909		
6. Cassettes, Answering System	3K5983		
7. Noodle Makers	11K8843		
8. Chains, Bicycle	6K48726		
9. Boots, Boys'	54K15395F		
10. Tiles, Mirror	21K6136C		
11. Fans, Mobile Home	28K49287		
12. Overalls, Tall Men's	51K12467F		
13. Mops	11K6700C		
14. Needles, Sewing Machine	20K6740		
15. Lights, Battery	34K4690		
16. Rainwear, Boys'	40K64002F		
17. Caps, Bottle	11K5117		
18. Locks, Tool Cabinet, Chest	9K65116		
19. Meters, Fuel Consumption Vehicle	28K5559		
20. Telescopes	3K4454C		
21. Trunks, Baggage	14K7028NH		
22. Insect Traps	71K1477L		
23. Glasses, Field	3K2549C		
24. Stereo Cabinets	61K4599N		
25. Plastic Carpet Protectors	37K5001NPH		
26. Nail Guns	9K68426		
27. Metronomes	61K25651		
28. Bar Glassware	T21K10119		
29. Balls, Pool	6K25812		
30. Goggles, Safety	9K1859		
31. Ice Makers	46K86452N		
32. Pruning Equipment	9K86293N		
33. Leaf Disposal Bags	11K6125		
34. Lounge Chairs	1K9281NH		
35. Editors, Movie	3K9376		
36. Stands, Mailbox	9K96041C		
37. Waste Disposers, Kitchen	65K6657C		
38. Yogurt Makers	34K6584		
39. Animal Traps	6K22217		
40. Knives, Carpet	37K1380		
41. Magazine Files	3K3867C		
42. Ear Protectors, Industrial	9K18623		
43. Dryers, Clothes, Portable	26K40901N		
44. Roofs, Sun, Auto	28K48649		
45. Rancher's Boots	67K86503F		
46. Extinguishers, Fire	9K58033		
47. Flags, American	71K59133		
48. Walkers, Invalids'	8K1594L		
49. Cookie Sheets	11K1527		
50. Earphones, Television	58K6117		

Appendix G

Intercorrelations of Questionnaire Responses, Experimental Manipulations, and Performance

	Effort to Outcome 1	Valence 1	Effort to Performance	Experimenter Expectation 1	Performance to Outcome
Effort to Outcome 1		r***=.30 N = 106	r***=.31 N = 107	r***=.29 N = 107	r***=.46 N = 107
Valence 1	r***=.30 N = 106		r**=.26 N = 107	r = -.02 N = 107	r*= .19 N = 107
Effort to Performance	r***=.31 N = 107	r**= .26 N = 107		r = .06 N = 108	r*= .17 N = 108
Experimenter Expectation 1	r***=.29 N = 107	r= -.02 N = 107	r= .06 N = 108		r= .16 N = 108
Performance to Outcome	r***=.46 N = 107	r*= .19 N = 107	r*= .17 N = 108	r = .16 N = 108	
Motivation to Comply 1	r = .16 N = 107	r = .15 N = 107	r**= .27 N = 108	r**= .28 N = 108	r = .06 N = 108
Motivation to Comply 2	r***=.36 N = 106	r = .09 N = 106	r**= .27 N = 107	r***=.43 N = 107	r*= .19 N = 107
Effort to Outcome 2	r***= .30 N = 104	r*= .17 N = 104	r = .16 N = 105	r**= .26 N = 105	r = .03 N = 105
Valence 2	r***=.34 N = 107	r***=.64 N = 107	r**= .27 N = 108	r = .08 N = 108	r**= .22 N = 108
Experimenter Expectation 2	r***=.31 N = 107	r = .06 N = 107	r = .14 N = 108	r***=.66 N = 108	r = .11 N = 108

*p < .05 **p < .01 ***p < .001

	Motivation to Comply 1	Motivation to Comply 2	Effort to Outcome 2	Valence 2	Experimenter Expectation 2
Effort to Outcome 1	r = .16 N = 107	r***= .36 N = 106	r***= .30 N = 104	r***= .34 N = 107	r***= .31 N = 107
Valence 1	r = .15 N = 107	r = .09 N = 106	r*= .17 N = 104	r***= .64 N = 107	r = .06 N = 107
Effort to Performance	r**= .27 N = 108	r**= .27 N = 107	r = .16 N = 105	r** = .27 N = 108	r = .14 N = 108
Experimenter Expectation 1	r**= .28 N = 108	r***= .43 N = 107	r** = .26 N = 105	r = .08 N = 108	r***= .66 N = 108
Performance to Outcome	r = .06 N = 108	r*= .19 N = 107	r = .03 N = 105	r**= .22 N = 108	r = .11 N = 108
Motivation to Comply 1		r***= .47 N = 107	r = -.06 N = 105	r = .08 N = 108	r*= .19 N = 108
Motivation to Comply 2	r***= .47 N = 107		r = .09 N = 104	r = .08 N = 107	r***= .29 N = 107
Effort to Outcome 2	r = -.06 N = 105	r = .09 N = 104		r = .15 N = 105	r* = .21 N = 105
Valence 2	r = .08 N = 108	r = .08 N = 107	r = .15 N = 105		r = .07 N = 108
Experimenter Expectation 2	r*= .19 N = 108	r***= .29 N = 107	r*= .21 N = 105	r = .07 N = 108	

*p < .05 **p < .01 ***p < .001

	Valence Manipulation	Contingency Manipulation	Experimenter Expectation Manipulation	Motivation to Comply Manipulation	Performance
Effort to Outcome 1	r = .03 N = 107	r = .12 N = 107	r = -.04 N = 107	r = -.07 N = 107	r = .08 N = 107
Valence 1	r*= -.21 N = 107	r*= .22 N = 107	r = -.01 N = 107	r = -.10 N = 107	r = .04 N = 107
Effort to Performance	r*= -.18 N = 108	r = -.01 N = 108	r = .0 N = 108	r = .10 N = 108	r* = -.17 N = 108
Experimenter Expectation 1	r = .14 N = 108	r = .07 N = 108	r***= -.31 N = 108	r = -.01 N = 108	r = .14 N = 108
Performance to Outcome	r = -.04 N = 108	r = .04 N = 108	r = .04 N = 108	r = -.03 N = 108	r**= .27 N = 108
Motivation to Comply 1	r = -.13 N = 108	r*= .16 N = 108	r = -.11 N = 108	r = .06 N = 108	r**= .23 N = 108
Motivation to Comply 2	r = .03 N = 107	r = .11 N = 107	r = -.04 N = 107	r = -.03 N = 107	r = .10 N = 107
Effort to Outcome 2	r = .03 N = 105	r = -.12 N = 105	r*= -.18 N = 105	r = .03 N = 105	r = .02 N = 105
Valence 2	r*= -.21 N = 108	r*= .22 N = 108	r = .05 N = 108	r = -.08 N = 108	r = .11 N = 108
Experimenter Expectation 2	r = .07 N = 108	r = -.09 N = 108	r**= -.24 N = 108	r = .12 N = 108	r = .08 N = 108

*p < .05 **p < .01 ***p < .001

	Interpersonal Judgement Scale 1	Interpersonal Judgement Scale 2
Effort to Outcome 1	r = .15 N = 107	r*= .20 N = 107
Valence 1	r = .14 N = 107	r*= .19 N = 107
Effort to Performance	r**= .26 N = 108	r*= .20 N = 108
Experimenter Expectation 1	r = .02 N = 108	r*= .18 N = 108
Performance to Outcome	r = -.01 N = 108	r = .04 N = 108
Motivation to Comply 1	r = .11 N = 108	r = .15 N = 108
Motivation to Comply 2	r = .02 N = 107	r*= .18 N = 107
Effort to Outcome 2	r = .10 N = 105	r = .08 N = 105
Valence 2	r**= .25 N = 108	r*= .18 N = 108
Experimenter Expectation 2	r = .13 N = 108	r**= .23 N = 108

*p < .05
**p < .01
***p < .001

	Performance	Interpersonal Judgement Scale 1	Interpersonal Judgement Scale 2
Valence Manipulation	r*= -0.16 N = 108	0.08 N = 108	-0.01 N = 108
Contingency Manipulation	0.02 N = 108	0.10 N = 108	0.09 N = 108
Experimenter Expectation Manipulation	r** = .025 N = 108	0.10 N = 108	0.01 N = 108
Motivation to Comply Manipulation	-0.11 N = 108	-0.10 N = 108	-0.10 N = 108

*p < .05
**p < .01
***p < .001

Appendix H

Means and Standard Deviations of Dependent Variables and Questionnaire Responses

Student Questionnaire Item

Experimental Condition		Effort to Outcome 1	Valence 1	Effort to Performance	Experimenter Expectation 1
Valence	High	$\bar{X}$ = 5.30	4.56	4.37	5.17
		SD = 1.03	.82	1.29	1.38
	Low	$\bar{X}$ = 5.24	4.11	3.85	5.54
		SD = 1.27	1.27	1.52	1.19
Motivation to Comply	High	$\bar{X}$ = 5.35	4.44	3.96	5.37
		SD = 1.18	1.08	1.37	1.20
	Low	$\bar{X}$ = 5.19	4.23	4.26	5.33
		SD = 1.13	1.09	1.48	1.40
Effort to Outcome Contingency	High	$\bar{X}$ = 5.14	4.00	4.19	5.33
		SD = 1.33	1.26	1.49	1.31
	Medium	$\bar{X}$ = 5.20	4.42	3.97	5.17
		SD = 1.18	.91	1.36	1.25
	Low	$\bar{X}$ = 5.47	4.58	4.17	5.56
		SD = .91	1.00	1.46	1.34
Experimenter Expectation	High	$\bar{X}$ = 5.31	4.31	4.08	5.67
		SD = 1.30	.90	1.36	1.21
	Medium	$\bar{X}$ = 5.31	4.42	4.17	5.69
		SD = 1.17	1.32	1.52	1.91
	Low	$\bar{X}$ = 5.19	4.28	4.08	4.69
		SD = 1.01	1.03	1.44	1.35

Student Questionnaire Item

Experimental Condition		Performance to Outcome	Motivation to Comply 1	Motivation to Comply 2	Effort to Outcome 2	Valence 2	Experimenter Expectation 2
Valence	High	5.18	4.85	4.74	57.37	4.76	5.06
		1.26	1.22	1.24	34.85	1.15	1.26
	Low	5.07	4.50	4.81	59.98	4.15	5.22
		1.40	1.42	1.20	31.83	1.65	1.08
Motivation to Comply	High	5.17	4.59	4.81	56.67	4.57	5.00
		1.27	1.32	1.30	33.46	1.50	1.24
	Low	5.09	4.76	4.74	59.58	4.33	5.28
		1.39	1.34	1.13	33.40	1.40	1.09
Effort to Outcome Contingency	High	4.94	4.44	4.67	66.69	4.03	5.44
		1.55	1.48	1.37	34.27	1.61	.97
	Medium	5.36	4.61	4.66	52.34	4.53	4.78
		1.10	.96	1.00	26.64	1.32	1.12
	Low	5.08	4.97	5.00	56.89	4.81	5.19
		1.30	1.64	1.24	35.81	1.33	1.33
Experimenter Expectation	High	5.00	4.89	4.94	67.11	4.28	5.42
		1.35	1.33	1.23	29.93	1.56	1.05
	Medium	5.25	4.61	4.56	56.23	4.64	5.28
		1.27	1.20	1.13	35.35	1.38	1.14
	Low	5.14	4.53	4.83	52.67	4.44	4.72
		1.38	1.46	1.28	33.59	1.42	1.23

Experimental Condition		Dependent Variable: Judgement Scale Item 1	Judgement Scale Item 2	Performance
Valence	High	$\bar{X}$ = 5.04	4.85	31.50
		SD = .97	1.00	8.10
	Low	$\bar{X}$ = 5.20	4.83	28.81
		SD = 1.02	1.08	8.46
Motivation to Comply	High	$\bar{X}$ = 5.22	4.94	31.09
		SD = .98	1.00	8.01
	Low	$\bar{X}$ = 5.02	4.74	29.22
		SD = 1.00	1.07	8.66
Effort to Outcome Contingency	High	$\bar{X}$ = 5.08	4.86	29.53
		SD = 1.11	1.12	9.30
	Medium	$\bar{X}$ = 4.94	4.58	31.11
		SD = .92	.97	6.94
	Low	$\bar{X}$ = 5.33	5.08	29.83
		SD = .93	.97	8.79
Experimenter Expectation	High	$\bar{X}$ = 5.00	4.83	27.11
		SD = 1.01	1.08	7.70
	Medium	$\bar{X}$ = 5.11	4.83	31.19
		SD = 1.01	.97	6.85
	Low	$\bar{X}$ = 5.25	4.86	32.17
		SD = .97	1.07	9.62